

PACN Aquatic Biota Monitoring protocol quality control:

QA/QC in the PACN Aquatic World

Tahzay Jones

PACN Aquatic Ecologist

tahzay_jones@nps.gov

Why we feel QA/QC is important

With the limited land space in the Pacific islands and an increasingly significant proportion of park boundaries on “wildland-urban” interfaces, there exists a significant potential in the future to be required to defend the methods, processes, and results of our monitoring efforts in legal proceedings such as regulatory, land-use, and zoning issues.

There also exists a significant potential to defend our monitoring efforts as they relate to management and regulatory decisions

Three different approaches to biological QA/QC in the PACN

- Benthic Marine Communities monitoring
- Marine Fish monitoring
- Freshwater Animal Communities – streams monitoring

Benthic Marine Communities monitoring

- Benthic marine monitoring utilizes photographic datasets
- Photographs are taken in the field - 1 photo per meter on 25 meter transects (25 photos per transect with 30 transects per park)
- The photos are brought back to the office and uploaded
- The originals are duplicated and archived.
- The duplicates are used for data analyses.
- Photographs are imported into Photogrid and 50 points are analyzed for species located at each point (30 transects x 25 photos = 750 images).

Benthic Marine Communities monitoring QA/QC

**The marine ecologist
at the park then
randomly selects
10% of the images
(10% of 750 = 75
images)**

**Once the
analyses for a
park are
completed, the
data is
imported into a
local database.**

**These images are then
reanalyzed by the
Ecologist.**

Benthic Marine Communities monitoring QA/QC

There must be 90% agreement between the technician doing the initial analyses and the park based marine ecologist.

If the data does not meet the 90% agreement, the entire dataset is reanalyzed and recompared.

If this there is the requisite 90% agreement or greater, the data is certified with the appropriate agreement percentage.



Marine Fish monitoring

- Marine fish monitoring uses belt transects
- The belt transects are 25 meters long and 5 meters wide.
- A single data collector swims along the transect at ~ 1.5 meters per minute (total time to finish the transect is ~15 minutes)
- Data on fish species, size, and abundance are collected
- Data is then transcribed and entered into a local database and analyzed

Marine Fish monitoring QA/QC challenges

A close-up photograph of a lionfish, characterized by its brown and white vertical stripes and long, spiny appendages. The fish is positioned in the center of the frame, swimming over a sandy and rocky seabed. The background is slightly blurred, showing more of the ocean floor and some greenish-brown vegetation.

The initial data collected cannot be confirmed by a second dive (non-territorial species leave)

Nor by a second data collector (possibility of scaring fish away)

We meet these challenges through training!

Marine Fish monitoring QA/QC



Training of a marine fish data collector involves paired training dives with a local marine fish expert to demonstrate the ability to accurately identify species and abundance on multiple dives.

An agreement threshold between the local expert and the marine fish data collector must be met prior to being certified as a marine fish data collector (current acceptable limits await confirmation through comparative field testing).

Training dives also include placing fish cutouts of various sizes along a transect with the diver accurately able to size fish to an acceptable threshold. (current acceptable limits await confirmation through field testing).

Marine Fish monitoring QA/QC

- Actual fish data collection dives will only be conducted by certified marine fish data collectors for that area.**
- 
- A photograph of a marine fish, likely a spotted grouper, swimming over a coral reef. The fish has a yellowish-brown body with dark brown spots and a white stripe along its side. It is positioned in the center of the frame, facing right. The background consists of various types of coral and sea anemones in shades of brown, green, and white.
- The number of different data collectors used in any field season will be limited as much as possible to prevent observer-observer variations in the dataset.**
 - Data collectors must be certified each year.**

Freshwater Animal Communities – Streams monitoring

**Stream monitoring
utilizes snorkel
surveys**

**Quadrats in each
randomly selected
stream reaches are
sampled**

**Fish, shrimp, and
snail species in
each quadrat are
identified, counted,
sized and written
onto field log forms**

**Other habitat
information is
collected and
added**

**Data is then
transcribed to the
resident database
for certification
and analysis.**



Freshwater Animal Communities – Streams

QA/QC challenges

The initial data collected cannot be confirmed by a second data collector

(Because of the possibility of scaring fish away)

The data collector must “remember” species and counts and call them out after the initial survey.

(The streams are too shallow to carry a field book and write while collecting data, as constant entry into and out of the water would scare fish away)



Freshwater Animal Communities – Streams monitoring QA/QC

A photograph showing two individuals wading in a stream. The person on the left is wearing a pink long-sleeved shirt and a dark backpack, holding a green net. The person on the right is wearing a white t-shirt and a tan cap, also holding a green net. The stream is filled with large green lily pads and other aquatic plants. The water is murky and brown.

**Again,
training
is KEY!**

Field personnel will be trained in sampling methods, equipment, and techniques and be required to successfully identify all targeted biotic groups (fish, shrimp, and snails) in PACN streams prior to being certified to collect field data

Freshwater Animal Communities

– Streams monitoring QA/QC

Primary data collection will be limited to the fewest possible personnel to reduce observer-observer differences



Time delayed reassessments of quadrats by the same (or potentially a separate) individual will also be utilized, possible because of the territoriality of the fish species present in PACN streams.

Additional quality control quadrats within selected stream site monitoring segments will be sampled within each park by separate individuals trained in the stream assessment methods

A Brief Summary

Paired training

Reassessments of data

**Quality
Control
sampling**

**Observer
testing**

Time delayed reassessments

Training with threshold testing